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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/573,165	11/22/2006	Akito Tanaka	43512-104208	6607
23644 7590 04/30/2009 BARNES & THORNBURG LLP P.O. BOX 2786 CHICAGO, IL 60690-2786				
EXAMINER				
HAQ, SHAFIQTUL				
ART UNIT		PAPER NUMBER		
1641				
NOTIFICATION DATE		DELIVERY MODE		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

Patent-ch@btlaw.com

Office Action Summary

Application No.

10/573,165

Applicant(s)

TANAKA ET AL.

Examiner

SHAFIQUIL HAQ

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-47 is/are pending in the application.
- 4a) Of the above claim(s) 4-8 and 13-47 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 9-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-85/86)
Paper No(s)/Mail Date 12/29/06 and 3/19/07
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Response to Election-Restriction

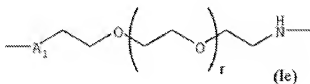
1. Applicants' election of Group I, claims 1-7, 9-12 and 14-16 filed February 27, 2009 in response to Office Action of January 28, 2008 is acknowledged and entered. Applicants' election of the compound as disclosed in claim 11 for a single species of "hydrophilic spacer", the compound of claim 12 for a single species of "starting monomer, wherein the monomer incorporates a hydrophilic spacer" (i.e. a monomer consisting of methacrylate and a hydrophilic spacer of claim 11) and copolymer of the monomer as in claim 12 and methacrylic monomer for a single species of "a copolymer of a compound" is also acknowledged. Claims 4-7 and 14-16 of the elected group do not read on the elected species.

Because applicant did not traverse election requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Accordingly, the restriction requirement is deemed proper and is made FINAL.

As set forth in the restriction requirement and an election of single species, the invention will encompass all compounds that fall within the scope of the claim is as follows:

The resin of claim 1 wherein:

The starting monomer is (meth)acrylic monomer and the hydrophilic spacer is



Wherein A₁ = -O- and r = 1-10.

As a result of the election and the corresponding scope of the compound identified, claims 4-8 and 13-47 and remaining subject matter of claims 1, 3 and 9 (i.e. the subject matter of patentably distinct species of "spacer" and "starting monomers") are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a non-elected invention. The withdrawn subject matter of claims 1, 3 and 9 (i.e. the subject matter of patentably distinct species of "spacer" and "starting monomers") is properly restricted as it differs materially in structure and in element from the elected subject matter *supra* so as to be patentably distinct there from.

2. Therefore, claims 1-3 and 9-12 are examined on merits in this office action.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-3 and 9-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
5. Claim 1 recites the term "starting material monomer" in lines 1-2. The term "starting material monomer" is not clearly defined in the specification and thus it is unclear what compounds Applicants are intended to encompass by the

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term "starting material monomer". Further, the chemical structure and nature of the "starting material monomer" is unclear.

6. Claim 1 recites the phrase "wherein the monomer incorporates a hydrophilic spacer" in line 2. The term "incorporates" is not a positive recitation and thus it is vague and indefinite as to whether the "hydrophilic spacer" is actually incorporated with the monomer i.e. it is unclear as to whether the "hydrophilic spacer" is a component of the claimed resin obtained by polymerization of the starting material.
7. With regard to claim 3, it is unclear whether the dashes (-) on either side of the compound of formula (Ie) represents a methyl group or a linkage/bond?

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Song *et al* (Journal of Applied Polymer Sciences 1996).

Claim 1 is directed to a resin comprising a polymer having a hydrophilic spacer. The phrase "wherein a ligand is optionally immobilized on the resin" is not a positive recitation and thus the ligand is not considered as a component of the claimed resin. The product by process language "obtained

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by polymerizing a starting material monomer, wherein the monomer incorporates a hydrophilic spacer" would provide a polymer comprising a hydrophilic spacer.

Song *et al* disclose a urethane acrylate resin prepared from PEG-modified urethane acrylates (PMUA (i.e. monomer comprising a hydrophilic spacer) and urethane acrylate anionomers (UAA) (abstract; page 1775, second paragraph of right column). The resin of Song's as described above thus comprises a polymer comprising hydrophilic spacer and therefore, reads on the resin of instant claim 1.

With regard to claim 2, the monomner PEG-modified urethane acrylates contains methacrylic group (see the top compound of scheme 1 and compounds A and B of Scheme 2) and thus is considered as an (meth)acrylic monomer.

10. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Cook *et al* (Journal of Applied Polymer Sciences 1993).

Claim 1 is directed to a resin comprising a polymer having a hydrophilic spacer. The phrase "wherein a ligand is optionally immobilized on the resin" is not a positive recitation and thus the ligand is not considered as a component of the claimed resin. The product by process language "obtained by polymerizing a starting material monomer, wherein the monomer incorporates a hydrophilic spacer" would provide a polymer comprising a hydrophilic spacer.

Cook *et al* disclose resins prepared from polymerization of monomers comprising polyethylene oxide spacer (i.e. hydrophilic spacer). See Table I and Table II of Cook disclosing several polyethylene oxide containing methacrylate monomers used to prepare resins (page 1055, lines 1-3 of left column).

With regard to claim 2, the monomers DEGDM, TEGDM, TETGDM, BDDM, and HDDM (Table II) contains methacrylic group and thus are considered as an (meth)acrylic monomers.

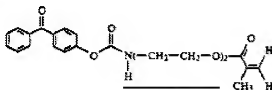
11. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being unpatentable over Rehmer *et al* (US 5073611).

Claim 1 is directed to a resin comprising a polymer having a hydrophilic spacer. The phrase "wherein a ligand is optionally immobilized on the resin" is not a positive recitation and thus the ligand is not considered as a component of the claimed resin. The product by process language "obtained by polymerizing a starting material monomer, wherein the monomer incorporates a hydrophilic spacer" would provide a polymer comprising a hydrophilic spacer.

Rehmer *et al* disclose resin comprising methacrylic monomer comprising a hydrophilic spacer (column 12, lines 55-65; claim 2 and column 10, lines 48-51). Rehmer *et al* disclose polymeric resins prepared from polymerization of monomers having the following structure:

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Compound B 1 =



The above structure comprises (meth)acrylic group having a hydrophilic spacer (ethylene oxide groups) and thus the resin of Rehmer reads on the resins of claims 1-2.

Claim Rejections - 35 USC § 103

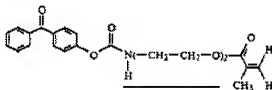
12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 3 and 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rehmer *et al* (US 5073611).

See the above teaching of resin comprising methacrylic monomer comprising a hydrophilic spacer. Rehmer *et al* disclose polymeric resins prepared from polymerization of monomers having the following structure:

Compound B 1 =



The above structure comprises (meth)acrylic group having a hydrophilic spacer wherein the partial structure of the hydrophilic spacer (as shown by underline) is $\text{-O-CH}_2\text{-CH}_2\text{-O-CH}_2\text{-CH}_2\text{-NH-}$, which is a chain homolog of the partial structure (Ie) of instant claims 3, 9 and 10 when $A_1=\text{O}$ and $r=1\text{-}10$.

The only difference between the partial structure of the hydrophilic spacer on instant claims 3 and 9-10 and the referenced spacer lie in the selection of ethylene oxide repeating group (by one repeating group when $r=1$) and homologs (compounds differing regularly by the successive addition of the same repeating group) are generally of sufficiently close structural similarity that there is a presumed expectation that such compounds possess similar properties. In re Wilder, 563 F.2d 457, 195 USPQ 426 (CCPA 1977).

Therefore, given the above fact that the two crosslinkers are chain homologs and are very similar, one would obviously expect them to show similar properties as a crosslinker.

The claimed spacers are so closely related structurally to the homologous compounds of the reference as to be structurally obvious therefore in the absence of any unobviousness or unexpected properties (MPEP § 2144.08). Applicants should note that a generic teaching is grounds for 35 USC § 103 (a) obviousness type of rejection. In looking at the instant claimed compounds as a whole, the claimed compounds would have been suggested to one skilled in the art unless unobvious or unexpected results can be shown.

With regard to claims 11-12, the hydrophilic spacer and the acryloyl monomer having the hydrophilic spacer (claim 12) would provide a

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methacryloyl resin having a hydrophilic spacer comprising -O-CH₂-CH₂-O-CH₂-CH₂-NH- that are as described above, would be a structural homolog of the resin of instant application differing only by ethylene oxide repeat group.

Conclusion

14. No claims are allowed.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shafiqul Haq whose telephone number is 571-272-6103. The examiner can normally be reached on 7:30AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark L. Shibuya can be reached on 571-272-0806. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Shafiqul Haq/
Examiner, Art Unit 1641